TEST RESULTS OF AGGREGATE IMPACT VALUE

Client	**Executive Engineer ,** R R Nagara Division, BBMP, Bangalore.
Agency	**Sri C T Raju,** Contractor, Bangalore.
Name of work	:Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
Source / Location	: Hot Mix Plant, Bangalore
BIS Code	: IS 2386 Part (4):1963
Type of Mix	: Dense Graded Bituminous Macadam
Date of test	01.02.2021

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W1 g	400	400	
2	Weight of agregate passing 2.36 mm sieve after the test = W2 g	88	86	
3	Weight of aggregate retained 2.36 mm sieve after the test = W3 g	312	314	
5	Aggregate Impact value = percent fines 100* (W2/W1) percent	22.00	21.50	**21.75**

Comments:

→ Maximum allowable Aggregate Impact value for Dense Graded Bituminous Macadam is 27% (Table 500-8 of MORTH specification)

Note:

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TEST RESULTS OF AGGREGATE IMPACT VALUE

Client	**Executive Engineer ,** R R Nagara Division, BBMP, Bangalore.
Agency	**Sri C T Raju,** Contractor, Bangalore.
Name of work	:Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
Source / Location	: Hot Mix Plant, Bangalore
BIS Code	: IS 2386 Part (4):1963
Type of Mix	: Dense Graded Bituminous Macadam
Date of test	01.02.2021

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W1 g	400	400	
2	Weight of agregate passing 2.36 mm sieve after the test = W2 g	82	84	
3	Weight of aggregate retained 2.36 mm sieve after the test = W3 g	318	316	
5	Aggregate Impact value = percent fines 100* (W2/W1) percent	20.50	21.00	**20.75**

Comments:

→ Maximum allowable Aggregate Impact value for Dense Graded Bituminous Macadam is 27% (Table 500-8 of MORTH specification)

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TEST RESULTS OF AGGREGATE IMPACT VALUE

Client	**Executive Engineer**, R R Nagara Division, BBMP, Bangalore.
Agency	**Sri C T Raju,** Contractor, Bangalore.
Name of work	:Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
Source / Location	: Hot Mix Plant, Bangalore
BIS Code	: IS 2386 Part (4):1963
Type of Mix	: Dense Graded Bituminous Macadam
Date of test	01.02.2021

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W1 g	400	400	
2	Weight of agregate passing 2.36 mm sieve after the test = W2 g	85	87	
3	Weight of aggregate retained 2.36 mm sieve after the test = W3 g	315	313	
5	Aggregate Impact value = percent fines 100* (W2/W1) percent	21.25	21.75	21.50

Comments:

→ Maximum allowable Aggregate Impact value for Dense Graded Bituminous Macadam is 27% (Table 500-8 of MORTH specification)

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JobNo: CQCE/BBMP/CTR/W.No.17/2020-21 Date 01.02.2021

TEST RESULTS OF AGGREGATE SHAPE TEST
(Flakiness & Elongation)

Client Executive Engineer , R R Nagara Division, BBMP, Bangalore.
Agency Sri C T Raju, Contractor, Bangalore.
Name of work : Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.

BIS Code : IS 2386 Part (1):1963
Date of Test 01.02.2021
Type of Mix : Dense Graded Bituminous Macadam

Sl.No.	Flakiness Index Value(%)	Elongation Index Value(%)	Total(Combined Flakiness and Elongation)(%)	Requirements
1	10.30	11.70	22.00	Maximum allowable Combined Flakiness and Elongation Indices for Dense Graded Bituminous Macadam is 35% as per Table 500.8 MORTH Specification.
2	11.50	10.90	22.40	

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JobNo: CQCE/BBMP/CTR/W.No.17/2020-21 Date 01.02.2021

TEST RESULTS OF AGGREGATE SHAPE TEST
(Flakiness & Elongation)

Client Executive Engineer , R R Nagara Division, BBMP, Bangalore.
Agency Sri C T Raju, Contractor, Bangalore.
Name of work : Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV. (10), BBMP, Bangalore.

BIS Code : IS 2386 Part (1):1963
Date of Test 01.02.2021
Type of Mix : Dense Graded Bituminous Macadam

Sl.No.	Flakiness Index Value(%)	Elongation Index Value(%)	Total(Combined Flakiness and Elongation)(%)	Requirements
1	12.50	10.80	23.30	Maximum allowable Combined Flakiness and Elongation Indices for Dense Graded Bituminous Macadam is 35% as per Table 500.8 MORTH Specification.
2	13.60	11.50	25.10	

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JobNo: CQCE/BBMP/CTR/W.No.17/2020-21 Date 01.02.2021

TEST RESULTS OF AGGREGATE SHAPE TEST
(Flakiness & Elongation)

Client Executive Engineer , R R Nagara Division, BBMP, Bangalore.
Agency Sri C T Raju, Contractor, Bangalore.
Name of work : Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV.(10), BBMP, Bangalore.

BIS Code : IS 2386 Part (1):1963
Date of Test 01.02.2021
Type of Mix : Dense Graded Bituminous Macadam

Sl.No.	Flakiness Index Value(%)	Elongation Index Value(%)	Total(Combined Flakiness and Elongation)(%)	Requirements
1	13.80	12.60	26.40	Maximum allowable Combined Flakiness and Elongation Indices for Dense Graded Bituminous Macadam is 35% as per Table 500.8 MORTH Specification.
2	12.50	14.10	26.60	

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Job No.: CQCE/BBMP/CTR/W.No.17/2020-21

Date: 03.02.2021

Specific Gravity And Water Absorption Test

Client	**Executive Engineer ,** R R Nagara Division, BBMP, Bangalore.
Agency	**Sri C T Raju,** Contractor, Bangalore.
Name of the Work	Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
BIS Code	IS 2386(Part 3):1963
Type of Mix	Dense Graded Bituminous Macadam
Date of Testing	01.02.2021 to 03.02.2021

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2020	2022	2023	
2	Weight of basket suspended in water	W_2 g	754	754	754	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1266	1268	1269	
4	Weight of saturated surface dry aggregate in air	W_3 g	2017	2016	2015	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	751	748	746	
6	Weight of oven dried aggregate	W_4 g	2007	2007	2005	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.672	2.683	2.688	2.681
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.709	2.716	2.724	2.716
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.50%	0.45%	0.50%	0.48%

Comments:

→ Maximum allowable Aggregate Water absorption value for Dense Graded Bituminous Macadam is 2.0%(As per MORTH table 500.8)

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Job No.: CQCE/BBMP/CTR/W.No.17/2020-21 Date: 01.02.2021

Aggregate Gradation Test

Client	**Executive Engineer**, R R Nagara Division, BBMP, Bangalore.
Agency	**Sri C T Raju,** Contractor, Bangalore.
Name of the Work	Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
BIS Code	IS 2386(Part 1):1963(RA 2011)
Sample I / D	Hot mix Plant, Bangalore.
Type of Mix	Dense Graded Bituminous Macadam
Date of Testing	01.02.2021

Total Weight of Sample: **10000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.10	Remarks
37.50	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
26.50	715	7.2	7.15	92.85	90 - 100	
19.00	1265	12.7	19.80	80.20	71 - 95	
13.20	1385	13.9	33.65	66.35	56 - 80	
4.75	2514	25.1	58.79	41.21	38 - 54	
2.36	1097	11.0	69.76	30.24	28 - 42	
0.300	1319	13.2	82.95	17.05	7 - 21	
0.075	1156	11.6	94.51	5.49	2 - 8	

Total Weight of Sample: **10000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.10	Remarks
37.5	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
26.5	685	6.9	6.85	93.15	90 - 100	
19	1415	14.2	21.00	79.00	71 - 95	
13.2	1136	11.4	32.36	67.64	56 - 80	
4.75	2415	24.2	56.51	43.49	38 - 54	
2.360	1159	11.6	68.10	31.90	28 - 42	
0.300	1312	13.1	81.22	18.78	7 - 21	
0.075	1174	11.7	92.96	7.04	2 - 8	

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Job No.: CQCE/BBMP/CTR/W.No 17/2020-21 Date: 01.02.2021

Aggregate Gradation Test

Client	**Executive Engineer**, R R Nagara Division, BBMP, Bangalore.
Agency	**Sri C T Raju**, Contractor, Bangalore.
Name of the Work	Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
BIS Code	IS 2386(Part 1):1963(RA 2011)
Sample I / D	Hot mix Plant, Bangalore.
Type of Mix	Dense Graded Bituminous Macadam
Date of Testing	01.02.2021

Total Weight of Sample: **10000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.10	Remarks
37.50	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
26.50	722	7.2	7.22	92.78	90 - 100	
19.00	1265	12.7	19.87	80.13	71 - 95	
13.20	1265	12.7	32.52	67.48	56 - 80	
4.75	2514	25.1	57.66	42.34	38 - 54	
2.36	1128	11.3	68.94	31.06	28 - 42	
0.300	1319	13.2	82.13	17.87	7 - 21	
0.075	1239	12.4	94.52	5.48	2 - 8	

Total Weight of Sample: **10000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.10	Remarks
37.5	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
26.5	689	6.9	6.89	93.11	90 - 100	
19	1358	13.6	20.47	79.53	71 - 95	
13.2	1236	12.4	32.83	67.17	56 - 80	
4.75	2563	25.6	58.46	41.54	38 - 54	
2.360	1212	12.1	70.58	29.42	28 - 42	
0.300	1247	12.5	83.05	16.95	7 - 21	
0.075	1245	12.5	95.50	4.50	2 - 8	

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Job No.: CQCE/BBMP/CTR/W.No.17/2020-21 Date: 01.02.2021

Aggregate Gradation Test

Client	**Executive Engineer ,** R R Nagara Division, BBMP, Bangalore.
Agency	**Sri C T Raju,** Contractor, Bangalore.
Name of the Work	Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
BIS Code	IS 2386(Part 1):1963(RA 2011)
Sample I / D	Hot mix Plant, Bangalore.
Type of Mix	Dense Graded Bituminous Macadam
Date of Testing	01.02.2021

Total Weight of Sample: **10000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.10	Remarks
37.50	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
26.50	728	7.3	7.28	92.72	90 - 100	
19.00	1369	13.7	20.97	79.03	71 - 95	
13.20	1265	12.7	33.62	66.38	56 - 80	
4.75	2487	24.9	58.49	41.51	38 - 54	
2.36	1128	11.3	69.77	30.23	28 - 42	
0.300	1269	12.7	82.46	17.54	7 - 21	
0.075	1239	12.4	94.85	5.15	2 - 8	

Total Weight of Sample: **10000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.10	Remarks
37.5	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
26.5	665	6.7	6.65	93.35	90 - 100	
19	1284	12.8	19.49	80.51	71 - 95	
13.2	1236	12.4	31.85	68.15	56 - 80	
4.75	2632	26.3	58.17	41.83	38 - 54	
2.360	1212	12.1	70.29	29.71	28 - 42	
0.300	1125	11.3	81.54	18.46	7 - 21	
0.075	1245	12.5	93.99	6.01	2 - 8	

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Job No.: CQCE/BBMP/CTR/W.No.17/2020-21

Date: 04.02.2021

TEST REPORT ON STABILITY OF MIX

Client	:	**Executive Engineer**, R R Nagara Division, BBMP, Bangalore.
Agency	:	**Sri C T Raju**, Contractor, Bangalore.
Name of the Work	:	Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
Type of Mix	:	Dense Graded Bituminous Macadam
Date of Testing	:	04.02.2021

The results of the tests conducted on the Dense Graded Bituminous Macadam mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.93	9.71	9 Kn (min)
2	Marshal flow, mm	3.79	3.84	2 – 4
3	Percent air voids in Mineral Aggregate	14.25	13.92	13 – 15
4	Voids in Compacted Mix	3.98	3.65	3 – 6
5	Percent Voids filled with Bitumen	67.42	69.12	65 - 75
6	Density, g/cc	2.26	2.25	--

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Job No.: CQCE/BBMP/CTR/W.No.17/2020-21 Date: 04.02.2021

TEST REPORT ON STABILITY OF MIX

Client	:	**Executive Engineer** , R R Nagara Division, BBMP, Bangalore.
Agency	:	**Sri C T Raju,** Contractor, Bangalore.
Name of the Work	:	Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
Type of Mix	:	Dense Graded Bituminous Macadam
Date of Testing	:	04.02.2021

The results of the tests conducted on the Dense Graded Bituminous Macadam mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.66	9.41	9 Kn (min)
2	Marshal flow, mm	3.48	3.52	2 – 4
3	Percent air voids in Mineral Aggregate	14.12	13.63	13 – 15
4	Voids in Compacted Mix	3.39	3.96	3 – 6
5	Percent Voids filled with Bitumen	67.79	69.85	65 - 75
6	Density, g/cc	2.27	2.26	--

Note:

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Job No.: CQCE/BBMP/CTR/W.No.17/2020-21 Date: 05.02.2021

TEST REPORT ON STABILITY OF MIX

Client	:	**Executive Engineer**, R R Nagara Division, BBMP, Bangalore.
Agency	:	**Sri C T Raju**, Contractor, Bangalore.
Name of the Work	:	Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
Type of Mix	:	Dense Graded Bituminous Macadam
Date of Testing	:	05.02.2021

The results of the tests conducted on the Dense Graded Bituminous Macadam mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.12	9.58	9 Kn (min)
2	Marshal flow, mm	3.36	3.64	2 – 4
3	Percent air voids in Mineral Aggregate	14.15	13.93	13 – 15
4	Voids in Compacted Mix	3.65	3.14	3 – 6
5	Percent Voids filled with Bitumen	67.48	69.82	65 - 75
6	Density, g/cc	2.27	2.25	--

Note:

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For CIVIL QUALITY CONSULTANTS & ENGINEERS

Authorised Signatory

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NABL Accredited As Per ISO/IEC : 17025:2005 Laboratory

Job No.: CQCE/BBMP/CTR/W.No.17/2020-21 Date: 05.02.2021

TEST REPORT ON STABILITY OF MIX

Client	:	**Executive Engineer**, R R Nagara Division, BBMP, Bangalore.
Agency	:	**Sri C T Raju**, Contractor, Bangalore.
Name of the Work	:	Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
Type of Mix	:	Dense Graded Bituminous Macadam
Date of Testing	:	05.02.2021

The results of the tests conducted on the Dense Graded Bituminous Macadam mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.63	9.45	9 Kn (min)
2	Marshal flow, mm	3.32	3.56	2 – 4
3	Percent air voids in Mineral Aggregate	14.21	13.78	13 – 15
4	Voids in Compacted Mix	3.14	3.89	3 – 6
5	Percent Voids filled with Bitumen	67.45	69.96	65 - 75
6	Density, g/cc	2.27	2.26	--

Note:

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Job No.: CQCE/BBMP/CTR/W.No.17/2020-21 Date: 06.02.2021

TEST REPORT ON STABILITY OF MIX

Client	:	**Executive Engineer**, R'R Nagara Division, BBMP, Bangalore.
Agency	:	**Sri C T Raju,** Contractor, Bangalore.
Name of the Work	:	Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
Type of Mix	:	Dense Graded Bituminous Macadam
Date of Testing	:	06.02.2021

The results of the tests conducted on the Dense Graded Bituminous Macadam mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.98	9.65	9 Kn (min)
2	Marshal flow, mm	3.87	3.54	2 – 4
3	Percent air voids in Mineral Aggregate	14.74	13.41	13 – 15
4	Voids in Compacted Mix	3.45	3.52	3 – 6
5	Percent Voids filled with Bitumen	67.56	69.63	65 - 75
6	Density, g/cc	2.26	2.27	--

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Job No.: CQCE/BBMP/CTR/W.No.17/2020-21 Date: 06.02.2021

TEST REPORT ON STABILITY OF MIX

Client	:	**Executive Engineer** , R R Nagara Division, BBMP, Bangalore.
Agency	:	**Sri C T Raju,** Contractor, Bangalore.
Name of the Work	:	Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
Type of Mix	:	Dense Graded Bituminous Macadam
Date of Testing	:	06.02.2021

The results of the tests conducted on the Dense Graded Bituminous Macadam mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.22	9.62	9 Kn (min)
2	Marshal flow, mm	3.98	3.88	2 – 4
3	Percent air voids in Mineral Aggregate	14.63	13.96	13 – 15
4	Voids in Compacted Mix	3.54	3.68	3 – 6
5	Percent Voids filled with Bitumen	67.17	69.15	65 - 75
6	Density, g/cc	2.27	2.25	--

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Job No.: CQCE/BBMP/CTR/W.No.17/2020-21 Date: 06.02.2021

TEST REPORT ON STABILITY OF MIX

Client	:	**Executive Engineer** , R R Nagara Division, BBMP, Bangalore.
Agency	:	**Sri C T Raju,** Contractor, Bangalore.
Name of the Work	:	Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
Type of Mix	:	Dense Graded Bituminous Macadam
Date of Testing	:	06.02.2021

The results of the tests conducted on the Dense Graded Bituminous Macadam mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.98	9.54	9 Kn (min)
2	Marshal flow, mm	3.87	3.65	2 – 4
3	Percent air voids in Mineral Aggregate	14.74	13.93	13 – 15
4	Voids in Compacted Mix	3.45	3.65	3 – 6
5	Percent Voids filled with Bitumen	67.56	69.17	65 - 75
6	Density, g/cc	2.25	2.26	--

Note:

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Job No.: CQCE/BBMP/CTR/W.No.17/2020-21 Date: 04.02.2021

BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX
AASHTO T 164 & AASHTO T 30

Client	Executive Engineer , R R Nagara Division, BBMP, Bangalore.
Agency	Sri C T Raju, Contractor, Bangalore.
Name of the Work	Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
Date of Testing	04.02.2021

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	477.5	477
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	22.50	23.00
7. Bitumen content in %	4.50	4.60
8. Average	4.55	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.10
37.5	0	0	0	100	100
26.5	35.2	35.2	7.4	92.6	90 - 100
19	71.8	107	22.4	77.6	71 - 95
13.2	63.2	170.2	35.6	64.4	56 - 80
4.75	84.5	254.7	53.3	46.7	38 - 54
2.360	71.9	326.6	68.4	31.6	28 - 42
0.300	92.3	418.9	87.7	12.3	7 - 21
0.075	22.4	441.3	92.4	7.6	2 - 8

SIEVE SIZE	Test 2				
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.10
37.5	0	0	0	100	100
26.5	32.5	32.5	6.8	93.2	90 - 100
19	78.9	111.4	23.4	76.6	71 - 95
13.2	64.2	175.6	36.8	63.2	56 - 80
4.75	85.10	260.7	54.7	45.3	38 - 54
2.360	79.9	340.6	71.4	28.6	28 - 42
0.300	92.3	432.9	90.8	9.2	7 - 21
0.075	22.1	455	95.4	4.6	2 - 8

For CIVIL QUALITY CONSULTANTS & ENGINEERS

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Job No.: CQCE/BBMP/CTR/W.No.17/2020-21 Date: 04.02.2021

BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX
AASHTO T 164 & AASHTO T 30

Client	**Executive Engineer ,** R R Nagara Division, BBMP, Bangalore.
Agency	**Sri C T Raju,** Contractor, Bangalore.
Name of the Work	Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
Date of Testing	04.02.2021

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	477.5	476.5
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	22.50	23.50
7. Bitumen content in %	4.50	4.70
8. Average	4.60	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	36.9	36.9	7.7	92.3	90 - 100
19	71.2	108.1	22.6	77.4	71 - 95
13.2	68.5	176.6	37.0	63.0	56 - 80
4.75	84.2	260.8	54.6	45.4	38 - 54
2.360	79.6	340.4	71.3	28.7	28 - 42
0.300	92.3	432.7	90.6	9.4	7 - 21
0.075	22.1	454.8	95.2	4.8	2 - 8

SIEVE SIZE	Test 2				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	32.1	32.1	6.7	93.3	90 - 100
19	80.5	112.6	23.6	76.4	71 - 95
13.2	69.2	181.8	38.2	61.8	56 - 80
4.75	85.10	266.9	56.0	44.0	38 - 54
2.360	73.2	340.1	71.4	28.6	28 - 42
0.300	95.8	435.9	91.5	8.5	7 - 21
0.075	22.2	458.1	96.1	3.9	2 - 8

For CIVIL QUALITY CONSULTANTS & ENGINEERS

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Job No.: CQCE/BBMP/CTR/W.No.17/2020-21 Date: 05.02.2021

BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX
AASHTO T 164 & AASHTO T 30

Client	Executive Engineer , R R Nagara Division, BBMP, Bangalore.
Agency	Sri C T Raju, Contractor, Bangalore.
Name of the Work	Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
Date of Testing	05.02.2021

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	477	476
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	23.00	24.00
7. Bitumen content in %	4.60	4.80
8. Average	4.70	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.10
37.5	0	0	0	100	100
26.5	30.5	30.5	6.4	93.6	90 - 100
19	78.5	109	22.9	77.1	71 - 95
13.2	63.2	172.2	36.1	63.9	56 - 80
4.75	84.7	256.9	53.9	46.1	38 - 54
2.360	79.8	336.7	70.6	29.4	28 - 42
0.300	93.2	429.9	90.1	9.9	7 - 21
0.075	22.5	452.4	94.8	5.2	2 - 8

SIEVE SIZE	Test 2				
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.10
37.5	0	0	0	100	100
26.5	36.5	36.5	7.7	92.3	90 - 100
19	72.4	108.9	22.9	77.1	71 - 95
13.2	66.9	175.8	36.9	63.1	56 - 80
4.75	84.50	260.3	54.7	45.3	38 - 54
2.360	72.3	332.6	69.9	30.1	28 - 42
0.300	96.5	429.1	90.1	9.9	7 - 21
0.075	22.4	451.5	94.9	5.1	2 - 8

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Job No.: CQCE/BBMP/CTR/W.No.17/2020-21 Date: 05.02.2021

BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX
AASHTO T 164 & AASHTO T 30

Client	Executive Engineer, R R Nagara Division, BBMP, Bangalore.
Agency	Sri C T Raju, Contractor, Bangalore.
Name of the Work	Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
Date of Testing	05.02.2021

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	477	477.5
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	23.00	22.50
7. Bitumen content in %	4.60	4.50
8. Average	4.55	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.10
37.5	0	0	0	100	100
26.5	36.2	36.2	7.6	92.4	90 - 100
19	78.4	114.6	24.0	76.0	71 - 95
13.2	62.9	177.5	37.2	62.8	56 - 80
4.75	80.5	258	54.1	45.9	38 - 54
2.360	77.7	335.7	70.4	29.6	28 - 42
0.300	92.5	428.2	89.8	10.2	7 - 21
0.075	22.3	450.5	94.4	5.6	2 - 8

SIEVE SIZE	Test 2				
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.10
37.5	0	0	0	100	100
26.5	32.7	32.7	6.8	93.2	90 - 100
19	78.5	111.2	23.3	76.7	71 - 95
13.2	63.2	174.4	36.5	63.5	56 - 80
4.75	85.10	259.5	54.3	45.7	38 - 54
2.360	79.2	338.7	70.9	29.1	28 - 42
0.300	98.6	437.3	91.6	8.4	7 - 21
0.075	24.1	461.4	96.6	3.4	2 - 8

For CIVIL QUALITY CONSULTANTS & ENGINEERS

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Job No.: CQCE/BBMP/CTR/W.No.17/2020-21 Date: 06.02.2021

BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX
AASHTO T 164 & AASHTO T 30

Client	Executive Engineer , R R Nagara Division, BBMP, Bangalore.
Agency	Sri C T Raju, Contractor, Bangalore.
Name of the Work	Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
Date of Testing	06.02.2021

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	477.5	477
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	22.50	23.00
7. Bitumen content in %	4.50	4.60
8. Average	4.55	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	32.3	32.3	6.8	93.2	90 - 100
19	69.8	102.1	21.4	78.6	71 - 95
13.2	64.5	166.6	34.9	65.1	56 - 80
4.75	82.1	248.7	52.1	47.9	38 - 54
2.360	77.6	326.3	68.3	31.7	28 - 42
0.300	95.8	422.1	88.4	11.6	7 - 21
0.075	35.9	458	95.9	4.1	2 - 8

SIEVE SIZE	Test 2				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	32.6	32.6	6.8	93.2	90 - 100
19	78.9	111.5	23.4	76.6	71 - 95
13.2	65.4	176.9	37.1	62.9	56 - 80
4.75	85.30	262.2	55.0	45.0	38 - 54
2.360	79.8	342	71.7	28.3	28 - 42
0.300	95.2	437.2	91.7	8.3	7 - 21
0.075	22.2	459.4	96.3	3.7	2 - 8

For CIVIL QUALITY CONSULTANTS & ENGINE

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Job No.: CQCE/BBMP/CTR/W.No.17/2020-21 Date: 06.02.2021

BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX
AASHTO T 164 & AASHTO T 30

Client	Executive Engineer , R R Nagara Division, BBMP, Bangalore.
Agency	Sri C T Raju, Contractor, Bangalore.
Name of the Work	Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
Date of Testing	06.02.2021

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	476	477
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	24.00	23.00
7. Bitumen content in %	4.80	4.60
8. Average	4.70	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.10
37.5	0	0	0	100	100
26.5	35.9	35.9	7.5	92.5	90 - 100
19	71.5	107.4	22.6	77.4	71 - 95
13.2	66.8	174.2	36.6	63.4	56 - 80
4.75	85.6	259.8	54.6	45.4	38 - 54
2.360	79.8	339.6	71.3	28.7	28 - 42
0.300	96.4	436	91.6	8.4	7 - 21
0.075	25.8	461.8	97.0	3.0	2 - 8

SIEVE SIZE	Test 2				
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.10
37.5	0	0	0	100	100
26.5	29.6	29.6	6.2	93.8	90 - 100
19	77.9	107.5	22.5	77.5	71 - 95
13.2	66.5	174	36.5	63.5	56 - 80
4.75	84.10	258.1	54.1	45.9	38 - 54
2.360	72.3	330.4	69.3	30.7	28 - 42
0.300	96.5	426.9	89.5	10.5	7 - 21
0.075	24.7	451.6	94.7	5.3	2 - 8

For CIVIL QUALITY CONSULTANTS & ENGINEERS

Authorised Signatory

Note:

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(Buildings Geo-Tech & Highway Materials Testing Laboratory)
An ISO 9001: 2015 Certified Company
NABL Accredited As Per ISO/IEC : 17025:2005 Laboratory

JAS-ANZ
ISO 9001:2000 CERTIFIED

Job No.: CQCE/BBMP/CTR/W.No.17/2020-21

Date: 06.02.2021

BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX

AASHTO T 164 & AASHTO T 30

Client	**Executive Engineer ,** R R Nagara Division, BBMP, Bangalore.
Agency	**Sri C T Raju,** Contractor, Bangalore.
Name of the Work	Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
Date of Testing	06.02.2021

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	476.5	477
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	23.50	23.00
7. Bitumen content in %	4.70	4.60
8. Average	4.65	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	29.4	29.4	6.2	93.8	90 - 100
19	70.6	100	21.0	79.0	71 - 95
13.2	61.2	161.2	33.8	66.2	56 - 80
4.75	85.7	246.9	51.8	48.2	38 - 54
2.360	72.3	319.2	67.0	33.0	28 - 42
0.300	95.6	414.8	87.1	12.9	7 - 21
0.075	24.8	439.6	92.3	7.7	2 - 8

SIEVE SIZE	Test 2				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	30.1	30.1	6.3	93.7	90 - 100
19	79.8	109.9	23.0	77.0	71 - 95
13.2	63.6	173.5	36.4	63.6	56 - 80
4.75	81.2	254.7	53.4	46.6	38 - 54
2.360	79.8	334.5	70.1	29.9	28 - 42
0.300	90.2	424.7	89.0	11.0	7 - 21
0.075	25.8	450.5	94.4	5.6	2 - 8

For CIVIL QUALITY CONSULTANTS & ENGINEERS

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ISO 9001:2000 CERTIFIED

Job No.: CQCE/BBMP/CTR/W.No.17/2020-21

Date: 08.02.2021

TEST REPORT

Client	:	**Executive Engineer** , R R Nagara Division, BBMP, Bangalore.
Agency	:	**Sri C T Raju,** Contractor, Bangalore.
Name of the work	:	Compreshensive development of roads, drains and footpath in HMT Layout, SBM Colony and Surrounding Areas in Ward No.17 under PACKAGE-2019-20 RRN-DIV-(10), BBMP, Bangalore.
IS Code	:	IS 73:2013, IS 1203:1978(RA 2008), IS 1205:1978(RA 2009), IS 1208:1978(RA 2009), IS 1209:1978(RA 2009)
Source of location	:	Hot mix Plant, Bangalore, VG 30
Date of testing	:	08.02.2021

The results of the tests conducted on the bitumen sample using for Bituminous Concrete

Sl. No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	50	Min 45
2	Softening point, ^{0}C	48	Min. 47
3	Ductility at 27^{0}C, cm	> 100	Min. 40
4	Flash Point, ^{0}C	280	Min. 220

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